6.1: Solving Inequalities Using Addition and Subtraction

Goals:

***Graph inequalities on a number line**

- Decide if the circle is open or closed
- Decide which direction the arrow should point

***Solve one-step inequalities using addition and subtraction**

$x \geq 5$ means that x can be: 5 or more

$x < -1$ means that x can be _anything less than –1_____. x CANNOT be __–1__!

To Graph a Number on a number line:

1. Start at the number on the number line.

2. Place a closed (filled in) circle if ≥ or ≤. This means that the number is included in the solution.

   Place an open circle if > or <. This means the number is not included in the solution.

3. Draw an arrow pointing to all of the other possibilities (Hint: If the variable is on the left, then the arrow points the same way as the inequality sign)

Graph the following inequalities on a number line:

Ex: Graph $x < 3$.

Ex: Graph $x \geq -1$

Ex: Graph $5 \geq x$ (if you read this starting with x, it would say that x is less than or equal to 5)

Solving inequalities using addition and subtraction:

Ex: $x - 1 > 2$

$+1 \quad +1$

$x > 3$

Solve and graph solution on a number line:

Ex: $x - 9 \leq 3$

$+9 \quad +9$

$x \leq 12$

Ex: $p - 9 < 5$

$+9 \quad +9$

$p < 14$

Ex: $-1 \geq m - 2$

$+2 \quad +2$

$1 \geq m$

$m \leq 1$

Ex: $9 \geq x + 7$

$-7 \quad -7$

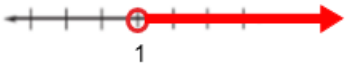
$2 \geq x$

$x \leq 2$

Ex: $y + 5 > 6$

$-5 \quad -5$

$y > 1$



Ex: You are checking a bag at an airport. Bags can weigh no more than 50 pounds. Your bag currently weighs 16.8 pounds and you plan on adding w pounds to your bag in travel items.

a) Write an inequality to represent the situation.

$16.8 + w \leq 50$

b) Find the possible weights w that you can add to the bag.

$16.8 + w \leq 50$

$-16.8 \quad -16.8$

$w \leq 33.2$